

SCIENCE ABSTRACTS, SERIES A

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SUBJECT INDEX-PART II

INTRODUCTION

The entries in this index refer to the abstracts by their serial number, not by the page number. The entries are grouped under headings (printed in bold type, e.g. "Abrasion") which represent, in the main, general categories or concepts rather than specific names. If a heading for a particular subject does not appear, a more general heading should be consulted; for example, "Zone plates" would be listed under "Diffraction/light"; "Barkhausen discontinuities" under "Magnetization process". There are numerous cross-references directing attention to related headings in other parts of the index.

Many of the headings are subdivided by the use of subheadings, which are indented (i.e. printed slightly to the right) and commence with a small letter (for example, see the subheadings under "Absorption").

ARRANGEMENT OF HEADINGS AND SUBHEADINGS

The headings are arranged throughout the index in alphabetical order according to British Standard 1749:1951 (the "word by word" system, not "reading right through"). The subheadings, with a few exceptions, are themselves arranged in alphabetical order under their respective headings. The exceptions (for example, see the subheadings under "Spectra", "Crystal structure, atomic") are cases where a more logical order is preferable to a purely alphabetical one.

ARRANGEMENTS OF ENTRIES UNDER HEADINGS

Entries are arranged in two alphabetical groups as follows. First group: generalities and named substances (in words); second group: named substances (chemical formulae). If a search is being made for a particular substance, both the first and second alphabetical groups should be inspected since, for example, alumina may also be listed as Al_2O_3 .

COLLECTED LIST OF SUBJECT HEADINGS

The alphabetical arrangement of the headings is the most convenient for locating a known heading quickly, but there may be other related headings elsewhere in the index of which the reader is unaware, and which he would only come across by accident. To assist the reader to discover all the headings appropriate to his subject, a collected list of the headings is given on pages S2 to S16, which follow this page; they should be consulted as a matter of routine each time a search is made. In this list, the headings are not arranged in alphabetical order, but are grouped into sections by subject on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. By using this list, the reader can quickly determine which are the headings appropriate to his subject, and they are then easily found in the main index in their alphabetical position.

HEADINGS WITH NO ENTRIES

Because physics is a developing subject, it is not possible to maintain the list of headings unchanged from year to year; it is subject to a continuous process of revision, with the introduction of new headings and subheadings, and the alteration and elimination of old ones. This process is a gradual one, however, and the great majority of the headings are the same as those of the previous year. To assist in maintaining the continuity of the index, all the headings in current use in a given year are printed, even those for which there are no abstracts to be recorded. The latter are followed by the announcement "No entries"; this supplies confirmation that these headings have not been dropped from the index, and entries may reappear under them in the next issue of the index.

ELEMENTS, COMPOUNDS AND OTHER SUBSTANCES

The names of elements, their compounds, a few compounds of special interest (e.g. "Ruby", "Water") and a few common materials (e.g. "Wood", "Paper") are included as headings or subheadings (e.g. "barium titanate" under "Barium compounds"). Under these, as well as under the appropriate "subject" headings, are listed any abstracts which contain significant physical information about the element, compound or substance named; except however, that abstracts listed under headings referring to nuclear properties, including radioactivity, are not necessarily also listed under the substance name. The entries under these headings are themselves arranged in alphabetical order of substance or nuclide names, so that a given substance can be readily located.

Inorganic compounds of the elements are listed under the first element in the chemical formula, and all the compounds of a given element are grouped under a single heading (e.g. "Sodium compounds"). Alloys are listed under compounds of the base or first-named constituent, e.g. Au-Ag alloys under "Gold compounds". There are also four special headings for the common alloys: "Aluminium alloys", "Copper alloys", "Iron alloys", "Nickel alloys". Organic compounds are grouped under "Organic compounds", "Polymers", "Plastics" and under special substance headings such as "Paper", "Proteins", etc.; all the latter are listed in the collected list of headings at the end of the index.

BEFORE USING INDEX, CONSULT LIST OF SUBJECT HEADINGS ON PAGES S2-S16, WHICH FOLLOW THIS PAGE

LIST OF SUBJECT INDEX HEADINGS

The headings used in the Alphabetical Index are listed below. The headings are grouped into sections on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. Each section lists the headings which concern its subject and it follows that many of the headings are listed in several places.

An introduction to the Subject Index will be found on page LS1.

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Reviews
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Leptons

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Tritons

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Atoms, mesic and muonic

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organic
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diatomic
diatomic, radiofrequency
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polyatomic, radiofrequency
inorganic liquids and solutions
inorganic solids
radiofrequency
organic molecules and substances
infrared
radiofrequency
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Valency
Zeeman effect

configuration and dimensions
inorganic
organic
excitation
internal mechanics
electronic structure
electronic structure, inorganic
electronic structure, organic
nuclear coupling
rotation
vibration
moments
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Magnetic resonance and
relaxation

Molecules/
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relaxation

Nuclear magnetic resonance
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relaxation

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Association
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Association
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Mesic and Muonic Molecules

Molecules, mesic and muonic

ELECTRIC DISCHARGES

Arcs, electric
Breakdown, electric
gases
Corona, electric discharge

Discharges, electric
glows
high-frequency
Gas-discharge tubes
Lightning
Sparks, electric
Sputtering

IONIZATION

Dissociation
Ion velocity
Ionization
gases
Ionization potential
Ionization, surface

Ions
recombination
scattering
Shock waves/
effects
Space charge

PLASMA

Discharges, electric
glows
high-frequency
Electron gas
Ionization
gases
Nuclear fusion
Nuclear reactors, fusion

Plasma
electromagnetic wave propagation
magnetohydrodynamics
measurement techniques
Shock waves/
effects
Space charge
Thermonuclear reactions

Plasma Confinement

Plasma/
confinement

Plasma Oscillations and Stability

Plasma/
magnetohydrodynamics
oscillations
stability

Plasma Devices

Nuclear reactors, fusion
Plasma/
devices

FLUIDS

Flow
Fluids
Hydrodynamics
Hydrostatics

Oscillations
Turbulence
Viscosity
Vortices
Waves

MECHANICS OF GASES

Acoustic streaming
Aerodynamics
Anemometers
Compressibility/
 gases
Condensation
Density/
 gases
Diffusion in gases
 thermal
Flow/
 gases
Flowmeters
Gases
Humidity

Hygrometers
Jets
Manometers
Moisture
Pressure
Pumps
Radiation pressure
Supersonic flow
Turbulence
Viscometers
Viscosity/
 gases
Vortices
Waves

GASEOUS STATE

Absorption/
 acoustic waves
 acoustic waves, ultrasonic
 electromagnetic waves
 light
Association/
 gases
Breakdown, electric/
 gases
Conductivity, electrical/
 gases
 measurement
Conductivity, thermal/
 gases
 measurement
Dielectric properties of substances/
 gases
Diffraction/
 acoustic waves
 acoustic waves, ultrasonic
 electromagnetic waves
 light
Diffusion/
 acoustic waves
 electromagnetic waves
 light
Electrical properties of substances
Electroluminescence
Equations of state/
 gases
Gases
Helium/
 gas
Interference/
 acoustic waves
Joule-Thomson effect
Kinetic theory/
 gases
Lasers/
 gaseous
Luminescence/
 gases

Magnetic resonance and relaxation
Molecules/
 intermolecular mechanics
Nuclear magnetic resonance and relaxation
Nuclear quadrupole resonance
Optical properties of substances
Paramagnetic resonance and relaxation
Reflection/
 acoustic waves
 acoustic waves, ultrasonic
 electromagnetic waves
 light
Refraction/
 acoustic waves
 acoustic waves, ultrasonic
 electromagnetic waves
 light
Scattering/
 acoustic waves
 acoustic waves, ultrasonic
 electromagnetic waves
 light
Sorption
Specific heat/
 gases
Spectra
Statistical mechanics
Thermoluminescence
Transmission/
 acoustic waves
 acoustic waves, ultrasonic
 light
Velocity/
 acoustic waves
 acoustic waves, ultrasonic

Viscosity · Diffusion

Diffusion in gases
 thermal
Transport processes
Viscosity/
 gases

VACUUM PHYSICS

Glass-metal seals
Leak detection
Manometers
Sputtering

Vacuum apparatus
Vacuum gauges
Vacuum pumps
Vacuum technique

MECHANICS OF LIQUIDS

Acoustic streaming	Drops	Hydrostatics	Sprays
Bubbles	Elasticity/ liquids	Jets	Surface energy
Capillarity	Emulsions	Liquid oscillations	Surface tension
Cavitation	Films/ liquid	Liquid waves	Surface tension measurement
Compressibility/ liquids	Filters	surface	Thixotropy
Density/ liquids	Flow/ liquids	Lubrication	Turbulence
Diffusion in liquids	Flowmeters	Moisture	Viscometers
thermal	Foams	Pressure	Viscosity/ liquids
Double refraction/ flow	Hydrodynamics	Pumps	Vortices
		Radiation pressure	Wetting
		Rheology	
		Schlieren systems	

LIQUID STATE**Liquids****Theory and Structure of Liquids Solutions**

Association/ liquids	Liquids structure
Electron diffraction examination	theory
Equations of state/ [of materials	Neutron diffraction examination of [materials
liquids	Neutrons/ scattering
Films/ liquid	Polymers
Heat of solution	Solubility
Liquid crystals	Solutions
	X-ray examination of materials/ liquids

Viscosity · Surface Tension · Diffusion

Diffusion in liquids	Sorption
thermal	Surface tension
Filters	Surface tension measurement
Membranes	Transport processes
Osmosis	Viscosity/ liquids

Optical Properties of Liquids

Absorption/ electromagnetic waves	Raman spectra
light	inorganic
Diffraction/ electromagnetic waves	organic
light	Reflection/ electromagnetic waves
Diffusion/ electromagnetic waves	light
light	Refraction/ electromagnetic waves
Double refraction	light
flow	Scattering/ electromagnetic waves
Electroluminescence	light
Luminescence/ liquids and solutions	Spectra/ inorganic liquids and solutions
Optical pumping	Thermoluminescence
Optical properties of substs.	Transmission/ light

Thermal Properties of Liquids

Conductivity, thermal/ liquids	Specific heat/ liquids
measurement	Thermal expansion
Heat of solution	Thermodynamic properties

Acoustical Properties of Liquids

Absorption/ acoustic waves	Refraction/ acoustic waves
acoustic waves, ultrasonic	acoustic waves, ultrasonic
Acoustic wave propagation	Scattering/ acoustic waves
ultrasonic	acoustic waves, ultrasonic
Diffraction/ acoustic waves	Transmission/ acoustic waves
acoustic waves, ultrasonic	acoustic waves, ultrasonic
Diffusion/ acoustic waves	Velocity/ acoustic waves
Interference/ acoustic waves	acoustic waves, ultrasonic
Reflection/ acoustic waves	
acoustic waves, ultrasonic	

Electrical and Magnetic Properties of Liquids

Absorption/ electromagnetic waves	Ionization, liquids
Breakdown, electric/ liquids	Magnetic properties of substs.
Conductivity, electrical/ liquids	Magnetic resonance and relaxation
liquids, electrolytic	Metals
measurement	Nuclear magnetic resonance and [relaxation
Dielectric properties of substs./ liquids and solutions	Nuclear quadrupole resonance
Electrical properties of substs.	Paramagnetic resonance and [relaxation
	Semiconducting materials
	Semiconductors

DISPERSIONS · COLLOIDS

Aerosols	Filters	Osmosis	Solubility
Centrifuges	Foams	Particle size	Solutions
Colloids	Gels	Precipitation	Surface phenomena
Disperse systems	Heat of solution	Sedimentation	Suspensions
Electrophoresis	Membranes	Sols	Thixotropy
Emulsions			

CHANGE OF STATE

Boiling	Equations of state	Heat of sublimation	Phase equilibrium
Boiling point	gases	Heat of transformation	Phase transformations
Condensation	liquids	Heat of vaporization	Sublimation
Critical constants, thermal	solids	Humidity	Supercooling
Distillation	Evaporation	Liquefaction, gases	Vapour pressure
Drying	Freezing	Melting	Vapour pressure measurement
	Heat of fusion	Melting point	Vaporization

SOLID-STATE PHYSICS

Bonds
Crystals
 internal fields
Crystal properties

Equations of state/
 solids
Metals
 theory

Mössbauer effect
Nuclear orientation
Orbital calculation methods

Solids
 structure
 theory

STRUCTURE OF SOLIDS · ALLOYS

Alloys
Crystal structure
Density/
 solids
Fibres
Filters
Granular structure
Heat treatment
 alloys
Membranes

Particle size
Permeability, mechanical
Polymorphism
Porous materials
Powders
Sintering
Solids
 structure
Solid solutions
Solubility

MICROSTRUCTURE OF SOLIDS

Amorphous state
Crystal structure/
 microstructure
Electron diffraction examination
 [of materials]
Electron microscope examination
 [of materials]
Electron microscopy
Fibres
Granular structure
Ion microscopes

Metallurgy
Microscopy
Neutron diffr. exam. of materials
Particle size
Porous materials
Powders
Radiography
Surface texture
X-ray examination of materials/
 microstructure
 molecular structure

Solid-State Phase Transformations

Heat treatment
 alloys
Phase equilibrium

Phase transformations/
 solid-state
Polymorphism
Precipitation

Surfaces

Surface energy
Surface measurement

Surface phenomena
Surface texture

Films

Evaporation
Films/
 solid

Sputtering
Sublimation

Adsorption

Adsorbed layers
Adsorption

Heat of adsorption
Sorption

NON-CRYSTALLINE STATE

Amorphous state
Glass
Plastics
Polymers

Rubber
Vitreous state
Waxes

CRYSTALLOGRAPHY

Crystal chemistry
Crystal properties
Crystal structure
Crystallization
Crystallography
Crystals
 etching
 faces
 growth
 orientation
 twinning
 whiskers

Minerals
Polymorphism
Precipitation
Solids/
 structure
Surface texture
Zone melting and refining

CRYSTAL LATTICE STRUCTURES

Crystal structure, atomic
 elements
 alloys
 inorganic compounds
 organic compounds
Electron diffraction crystallography
Electron diffraction examination
 [of materials]
Electron microscope examination
 [of materials]
Neutron diffraction crystallography
Neutron diffraction examination
 [of materials]
Polymers

X-ray absorption
X-ray crystallography
 apparatus
 calculation apparatus
 calculation methods
 technique
X-ray diffraction
X-ray examination of materials/
 molecular structure
X-ray measurement
X-ray monochromators
X-ray reflection
X-ray scattering
X-ray tubes

LATTICE MECHANICS

Crystals/
 lattice mechanics

Mössbauer effect

ACOUSTICAL PROPERTIES OF SOLIDS

Absorption/
 acoustic waves
 acoustic waves, ultrasonic
Acoustic wave propagation
 ultrasonic
Acoustoelectric effects
Diffraction/
 acoustic waves
 acoustic waves, ultrasonic
Dispersion, acoustic
 ultrasonic
Magnetoacoustic effects

Reflection/
 acoustic waves
 acoustic waves, ultrasonic
Refraction/
 acoustic waves
 acoustic waves, ultrasonic
Scattering/
 acoustic waves
 acoustic waves, ultrasonic
Transmission/
 acoustic waves
 acoustic waves, ultrasonic
Velocity/
 acoustic waves
 acoustic waves, ultrasonic

THERMAL PROPERTIES OF SOLIDS

Conductivity, thermal/
 measurement
 solids
Equations of state/
 solids

Heat conduction
Specific heat/
 solids
Thermal expansion
Thermodynamic properties

DIFFUSION IN SOLIDS

Diffusion in solids

Permeability, mechanical

DEFECT PROPERTIES OF SOLIDS

Cold working

Creep

Crystal imperfections

dislocations

interstitials

vacancies

Crystal structure

Crystals

etching

twinning

Deformation

Elastic deformation

Electron diffraction examination

[of materials]

Electron microscope examination

Heat treatment [of materials]

alloys

Internal friction

Neutron diffraction examination

Plastic deformation [of materials]

Plastic flow

Slip

Stresses, internal

Work hardening

X-ray examination of materials/
microstructure**Colour Centres**Absorption/
light

Colour centres

X-rays/
effects**RADIATION EFFECTS IN SOLIDS**Acoustic waves/
effectsAlpha-rays/
effectsBeta-rays/
effectsDeuterons/
effectsElectron beams/
effectsGamma-rays/
effectsHyperons/
effectsIon beams/
effectsMesons/
effectsNeutrons and antineutrons/
effects

Physical effects of radiations

Protons and antiprotons/
effects

Sputtering

X-rays/
effects**MECHANICAL PROPERTIES OF SOLIDS**

Abrasion

Adhesion

Bending

Brittleness

Cold working

Compressibility

Corrosion

Cracks

Creep

Deformation

Density/
solids

Elastic constants

measurement

Elastic deformation

Elastic fatigue

Elastic limit

Elastic relaxation

Elasticity

Fracture

Friction

Hardness

Heat treatment

alloys

High-pressure phenomena

Hysteresis [and effects]

Impact

Internal friction

Lubrication

Magnetomechanical effects

Mechanical properties of substs.

Mechanical strength

compressive

shear

tensile

Photoelasticity

Physical effects of radiations

Plastic deformation

Plastic flow

Plasticity

Rheology

Slip

Strain gauges

Stress analysis

Stress effects

Stress/strain relations

Stresses, internal

Thermoelasticity

Thixotropy

Torsion

Viscoelasticity

Wear

Work hardening

ELECTRON STATES IN SOLIDS

Crystal electron states

excitons

Fermi level

Fermi surface

plasma

polarons

surface

Crystal properties

Cyclotron resonance

Electron beams/
effects

Electron gas

Electron pairs/
annihilation

Electrons

absorption

radiation

scattering

Hall effect

Magnetoacoustic effects

Metals

theory

Piezoresistance

Solids

theory

Surface phenomena

ELECTRICAL PROPERTIES OF SOLIDS

Acoustoelectric effects

Conduction, electrical

Conductivity, electrical/
measurement

solids

Contact potential

Metals • Conductors

Electron gas

Hall effect

Magnetoelectric effects

Magnetoresistance

Contact resistance

Crystal electron states

Eddy-currents

Electrical properties of substs.

Electron gas

Metals

theory

Piezoresistance

Skin effect

Superconductivity

Superconductivity

Superconducting Materials and Devices

Superconducting materials and devices

Semiconductors

Acoustoelectric effects

Contact potential

Contact resistance

Electron gas

Electro-optical effects

Fluctuations/
electrical**Semiconducting Materials**

Semiconducting materials

gallium arsenide

germanium

indium antimonide

silicon

Metals

theory

Piezoresistance

Skin effect

Hall effect

Magnetoelectric effects

Magnetoresistance

Magnetothermal effects

Piezoelectricity

Piezoresistance

Semiconductors

Space charge

Semiconducting DevicesCounters/
semiconductor

Semiconducting devices

diodes

p-n junctions

transistors

tunnel diodes

Rectifiers

Electro-optical effects

Fluctuations/
electrical

Hall effect

Magnetoelectric effects

Magnetoresistance

Dielectrics

Breakdown, electric/
solids

Contact potential

Dielectric devices

Dielectric measurement

Dielectric phenomena

Dielectric properties of substs./
solids

Electrets

Electric charge

Electric fields

Electric strength

Magnetothermal effects

Piezoelectricity

Piezoresistance

Resistance, electrical

Space charge

Electrostriction

Ferroelectric materials

barium titanate

Ferroelectric phenomena

Hysteresis

Piezoelectric oscillations

Piezoelectricity

Pyroelectricity

Relaxation

Rochelle salt

Space charge

Triboelectricity

THERMOELECTRIC PROPERTIES OF SOLIDS

Thermocouples

Thermoelectricity

PHOTOCONDUCTIVITY • PHOTOVOLTAIC EFFECTS

Photoconductivity

Photoelectricity

Photoelectromagnetic effects

Photovoltaic effects

ELECTRON AND ION EMISSION BY SOLIDS

Cathodes

oxide

Electron emission

field emission

photoelectric

secondary

thermionic

Ion emission

secondary

thermionic

Ionization/
solids

Ionization, surface

Work function

MAGNETIC PROPERTIES OF SOLIDS

Antiferromagnetism	Ferromagnetism	Magnetic properties of substs.	Magnetoacoustic effects
de Haas-van Alphen effect	spin-wave theory	antiferromagnetic	Magnetolectric effects
Diamagnetism	Gyromagnetic ratio	diamagnetic	Magneto-optical effects
Electron diffraction examination	Hall effect	ferrimagnetic	Magneto-resistance
[of materials]	Hysteresis	ferromagnetic	Magnetostriction
Electron microscope examination	Magnetic devices	paramagnetic	Magneto-thermal effects
[of materials]	Magnetic fields/	transitions	Neutron diffraction examination
Ferrimagnetism	effects	Magnetism	[of materials]
Ferrites	Magnetic films	Magnetization process	Paramagnetism
		Magnetization state	Zeeman effect
		domains	

Paramagnetic Properties

Magnetic properties of substances/paramagnetic	Paramagnetism
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Ferromagnetic Properties

Ferromagnetism	Magnetic properties of substances/ferromagnetic
spin-wave theory	Magnetization process
Hysteresis	Magnetization state
Magnetic devices	domains
Magnetic films	

Ferrimagnetic Properties • Ferrites

Ferrimagnetism	Magnetic films
Ferrites	Magnetic properties of substs./ferrimagnetic
Hysteresis	
Magnetic devices	

Antiferromagnetic Properties

Antiferromagnetism	Magnetic properties of substs./antiferromagnetic
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MAGNETIC RESONANCES IN SOLIDS

Antiferromagnetic resonance	Ferromagnetic relaxation	Magnetic resonance and relaxation	Nuclear quadrupole resonance
Cyclotron resonance	Ferromagnetic resonance	Magnetomechanical effects	Optical pumping
Ferrimagnetic resonance	Gyromagnetic ratio	Nuclear magnetic resonance and measurement [relaxation]	Paramagnetic resonance and measurement [relaxation]

OPTICAL PROPERTIES OF SOLIDS

Absorption/	Lasers/	Refraction/	Spectral line breadth
electromagnetic waves	solid	electromagnetic waves	Stark effect
light	Magneto-optical effects	light	Transmission/
Diffraction/	Optical constants	Refractive index/	light
electromagnetic waves	Optical films	light	Transparency
light	Optical materials	Scattering/	Velocity/
Diffusion/	Optical properties of substances	electromagnetic waves	light
electromagnetic waves	Optical pumping	light	X-ray spectra
light	Optical rotation	Spectra/	absorption
Dispersion, optical	Photoelasticity	inorganic solids	emission
Double refraction	Pleochroism	radiofrequency	Zeeman effect
mechanical	Polarized light	organic molecules and	
Electromag. wave propagation	Raman spectra	infrared [substances	
Electro-optical effects	inorganic	radiofrequency	
Emissivity	organic		
Interference/	Reflection/		
light	electromagnetic waves		
	light		
	Reflectivity		

Luminescence of Solids

Colour centres	Luminescence/
Counters, scintillation	solids, inorganic
Electroluminescence	solids, organic
	Luminescent devices
	Thermoluminescence

PHYSICAL CHEMISTRY

Atomic mass and weight	Distillation	Laboratory app. and technique	Physical chemistry
Balances	Elements	Macromolecules	Precipitation
Bonds	origin	Molecular weight	Pumps
Centrifuges	relative abundances	Molecular weight determ.	Quantum chemistry
Chemical structure	Filters	Periodic system	Sedimentation
Chemical technology	Isomerism		Valency

THERMOCHEMISTRY • REACTIONS

Association	Heat of adsorption
gases	Heat of combustion
liquids	Heat of dissociation
Catalysis	Heat of formation
Chemical reactions	Heat of reaction
Combustion	Isotope exchanges
Corrosion	Oxidation
Crystal chemistry	Phase equilibrium
Detonation	Phase transformations
Dissociation	Polymerization
Exchanges, chemical	Polymers
Explosions	Reaction kinetics
Flames	Sorption
ELECTROCHEMISTRY	
Conductivity, electrical/	Electrolysis
liquids, electrolytic	Electrolytic deposition
Dissociation/	Electrophoresis
electrolytic	Ion velocity/
Electrochemistry	electrolytic
electrodes	Ions, electrolytic
Electrokinetic effects	

PHOTOCHEMISTRY**RADIATION CHEMISTRY**

RADIOCHEMISTRY	
Chemical effects of radiations	Nuclear reactions/
acoustic waves	chemical effects
ionizing radiations	Photochemistry
	Radiochemistry

PHYSICAL METHODS OF CHEMICAL ANALYSIS

Chemical analysis	Chromatography
adsorption	Radioactive tracers
by mass spectrometry	Spectrochemical analysis
by nuclear reactions	Tracers
electrochemical	
radioactive	
X-ray	

GEOPHYSICS

Earth age composition electricity heat rotation	Geodesy Geophysical prospecting Geophysics Glaciers	Gravity Minerals Oceanography Radioactive dating	Radioactivity Seawater Seismic waves Seismology Soil
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ATMOSPHERE

Anemometers Atmosphere composition humidity movements precipitation radioactivity structure temperature thermodynamics	Atmospheric acoustics Atmospheric electricity Atmospheric optics Atmospheric pressure and [density Atmospheric spectra Atmospherics Clouds Condensation	Electromagnetic wave atmosphere [propagation Evaporation Fallout Fog Humidity Hygrometers Ice Lightning Meteorological instruments	Meteorology Rain Rockets Satellites, artificial Sky brightness Snow Sunlight Thunderstorms Twilight Wind
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UPPER ATMOSPHERE

Airglow Atmosphere composition movements radiation belts radioactivity structure temperature thermodynamics upper Atmospheric electricity Atmospheric optics Atmospheric pressure and [density	Atmospheric spectra Atmospherics Aurora Fallout Ionization, atmosphere Meteors Rockets Satellites, artificial Sky brightness Sunlight Twilight Zodiacal light	Ionosphere Atmospherics Aurora Electromag. wave propagation ionosphere Ionization, atmosphere	Ionosphere D-region E-region F-region Ionosphere meas. apparatus
		SPACE RESEARCH TECHNIQUES Rockets Satellites, artificial Space research	Space vehicles instrumentation

GEOMAGNETISM

Compasses Earth/ magnetic field magnetic field, variations	Magnetic storms Rock magnetism
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ASTROPHYSICS

Astronomical instruments Astronomical observations Astronomical spectra Astronomy and astrophysics Celestial mechanics Cosmic rays Cosmology	Elements/ origin relative abundances Gravitation Interstellar matter Telescopes/ astronomical	SOLAR SYSTEM • SUN Comets Cosmic rays Earth rotation Gravitation Interplanetary magnetic field Interplanetary matter Meteorites Meteors Moon Planets Solar system	Sun corona eclipses flares magnetism prominences radiation radiation, corpuscular radiation, r.f. spectra Sunspots Zodiacal light
STARS • GALAXIES Cosmic radiations, r.f. Galaxies the Galaxy Interstellar matter Magnetohydrodynamics Nebulae Novae	Stars composition magnetism radiation spectra structure Thermonuclear reactions	RADIOASTRONOMY TECHNIQUES Cosmic radiations, r.f.	Radioastronomy

BIOPHYSICS

Biological effects of radiations Biological technique and [instruments Biology Biophysics Blood Dosimetry	Medical science Physiology Proteins Radiation protection Radiography Zoology
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TECHNIQUE • MATERIALS

Biological technique and instruments Chemical technology Heat treatment alloys Laboratory apparatus and technique Leak detection Low-temperature technique Materials	Metallurgy Vacuum technique Zone melting and refining
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**HIGH-PRESSURE
TECHNIQUES**

High-pressure phenomena
[and effects

SUBSTANCES

Chemical elements and inorganic compounds

All the chemical elements are listed by name, followed by their compounds, e.g. "Cadmium", "Cadmium compounds".

"Hydrogen" is subdivided by the subheadings "neutral atoms", "neutral molecules", and "ions". "Deuterium" and "Tritium" are independent headings. "Hydrogen compounds" is supplemented by "Ice", "Steam", and "Water".

"Oxygen" is supplemented by "Ozone", and "Carbon" is supplemented by "Diamonds" and "Graphite".

The following inorganic compounds are further subdivided by subheadings as shown:-

Barium compounds	Nitrogen compounds
barium titanate*	ammonia
Cadmium compounds	ammonium compounds
cadmium sulphide	Potassium compounds
Calcium compounds	potassium bromide
calcium fluoride	potassium chloride
Gallium compounds	Sodium compounds
gallium arsenide**	sodium chloride
Indium compounds	Zinc compounds
indium antimonide**	zinc sulphide
Lithium compounds	
lithium fluoride	

* Ferroelectric properties are listed under "Ferroelectric materials/barium titanate"

** Semiconducting properties are listed under the corresponding subheadings of "Semiconducting materials"

Organic compounds

Organic compounds are grouped under headings "Organic compounds", "Polymers", "Plastics", "Proteins". "Rochelle salt" is an independent heading.

Substance groups

In addition there are the following headings for groups of elements, compounds or substances:-

Actinides	Metals
Actinide compounds	Minerals
Alkali metals	Rare-earth metals
Alkali-metal compounds	Rare-earth compounds
halides	Semiconductors
Alkaline-earth metals	Semiconducting materials
Alkaline-earth compounds	gallium arsenide**
Ferrites	germanium**
Ferroelectric materials	indium antimonide**
barium titanate*	silicon**
Garnets	Transition metals
Halogens	Transition-metal compounds
Inert gases	

* Used for ferroelectric properties only

** Used for semiconducting properties only

Alloys

General papers on alloys are indexed under "Alloys". Alloys of specified composition are listed under, either

- (i) special alloy headings (there are five of them: "Aluminium alloys", "Copper alloys", "Iron alloys", "Nickel alloys", "Steel"), e.g. Al-Ni alloys under "Aluminium alloys", or
- (ii) compounds of the base or first-named element, e.g. Mn-Zn alloys under "Manganese compounds", and silicon-iron under "Iron alloys".

Special substances and materials

There are also the following special headings for certain common substances:-

Air	Paper
Blood	Porous materials
Ceramics	Powders
Clay	Quartz
Coal	Rubber
Concrete	Ruby
Fibres	Sand
Gelatin	Seawater
Glass	Soil
Mica	Waxes
Optical materials	Wood

ADP (ammonium dihydrogen phosphate). See Nitrogen compounds/ammonium compounds.

Abacs. See Nomograms.

Aberrations, optical

See also Electron lenses; Ion optics; Optical instrument testing; Optics/geometrical; Particle optics.
astigmatism, theory, use of stigmator algebra 7-24969
astronomical telescopes, afocal correctors for paraboloidal mirrors 7-33583
chromatic, axial astigmatism, rel. to max. resolution of electron microscope 7-34229
circular dichroism, general principles 7-30794
Fresnel surface, astigmatism 7-30754
gas lenses, tubular, due to gravity, theory 7-27782
interferometer, Mach-Zehnder, astigmatism 7-27848
lens combination, axial achromatism 7-34224
Mangin mirrors, colour-corrected 7-27776
photographic lens, chromatic, effect on resolving power 7-27900
quadrupole aberrations, real and virtual 7-34011
spherical, analysis, double wire testing 7-27772
spherical, transfer function for best corrected seventh-order 7-34228
reflectors, spherical and parabolic, 7th and 9th order, Maréchal balancing 7-24968
reversible semi-symmetric systems 7-27780
third-order, new derivation 7-27781
wave front profile electronic meas. 7-18854
zero 3rd order, 2-mirror reflecting system 7-27209
zone plate with aberration correction 7-27862

Abrasion

See also Hardness; Wear.
glass, protection by molten salts treatment 7-20764
machining errors, due to production-control instrums. inertia 7-27352
Eu chalcogenides single-crystal spheres grinding technique 7-33659
GaAs Gunn diodes, use of airabrasion in construction 7-20999

Absorption

See also subheadings of Alpha-rays; Beta-rays; Cosmic rays; Electrons; Gamma-rays; Hyperons; Mesons; Neutrons and antineutrons; Protons and antiprotons; and also Sorption; X-ray absorption.

acetylene, molecule on charcoal, neutron spectrometry 7-35714
azomethane derivatives spectra, fluorescence 7-33429
by Doppler lines uniformly spaced calc. 7-27811
ethylene, molecule on charcoal, neutron spectrometry 7-35714
gas on metal films, sticking probabilities 7-29305
gases, nongrey, nonscattering, effective coeffs. for radiant energy transport 7-36396
methane, molecule on charcoal, neutron spectrometry 7-35714
p-dioxane, solid phase, i.r. spectrum 7-33378
porcelains, triaxial, with SiO_2 and Al_2O_3 , of water rel. to fracture 7-38098
quartz, electronic dipole resonance absorpt., microwave 7-33352
silica gel, of water, evaporation specific heat 7-20144
spectra, rel. to emission spectra 7-34246
Ca, spectra, emission rel. to electronic structure 7-33275
 H_2 molecule on charcoal, neutron spectrometry 7-35714
Pt, adsorption of O_2 , also CO , H_2O and CO_2 7-32034
W, adsorpt. of Ba on individual cryst. planes 7-37017
W, of O_2 , rel. to photoelectron yield in vacuum u.v. 7-26788
 YVO_4 :Eu, and emission, empirical studies 7-33367

acoustic waves

See also Noise abatement; Transmission/acoustic waves.
absorption coeff. as functions at edge length 7-27479
by bladder fish, possible attenuation cause, note 7-33480
cylinder with sound-absorbing coating, scattering properties 7-27467
dielectrics Boltzmann equation treatment 7-37566
dielectrics, effect of electric field 7-37569
draperies 7-33844
ferroelectrics, dispersive-type, anomalous attenuation constant near Curie pt. 7-38757
ferromagnetic dielectrics, hypersound absorption 7-37567
gases, weakly ionized, phase vel., 0.1-6 Mc/s obs. 7-36401
liquid, negative dispersion, Brillouin scattering 7-36560
liquid, pure, near critical point 7-36552
liquids, above 300 Mc/s, sound receivers for meas. 7-20044
measurement in thin specimens using thick transducers 7-23786
negative dispersion, Brillouin scattering, viscous medium 7-31868
phonon scatt. and absorption effects calc. 7-23770
plasma: excitation, velocity obs. 7-31684
plate for oblique incidence 7-18622
quartz, microwave phonon attenuation on z-axis 7-37596
in reverberation chamber meas. 7-22227
Rochelle salt, effect of electric field 7-37569
room models 7-27478
shallow-water attenuation, possible explanation 7-40149

Absorption-contd

acoustic waves-contd

surface, periodically uneven, rectangular profile 7-27461
waveguide lined with absorbent, attenuation, influence of medium motion 7-24775
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Plexiglas. See Plastics.**Plutonium**

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- See also Nuclear magnetic resonance and relaxation;
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inorganic molecules, polyatomic, radiofrequency

See also Nuclear magnetic resonance and relaxation;
 Paramagnetic resonance and relaxation.

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